Statement of the Claims:

1. (Currently amended) An electronic weighing apparatus, comprising:

a) a displaceable elastic member means for receiving a load and being displaced by the load such that the displacement of said elastic member means is related to the weight of the load;

b) a first piezoelectric transducer having a first substrate and one of a first surface acoustic wave (SAW) ~~transmitterand~~ transmitter and a first SAW receiver, said first piezoelectric transducer being coupled to said elastic member;

c) a second piezoelectric transducer having a second substrate and the other of said first SAW transmitter and said first SAW receiver, said second piezoelectric transducer being mounted in close proximity to said first piezoelectric transducer such that said displacement of said elastic member causes a corresponding displacement of one of said first and second piezoelectric transducers relative to each other;

d) a first amplifier having an input and an output, said input of said first amplifier being coupled to said first SAW receiver and said output of said first amplifier being coupled to said first SAW transmitter such that said first piezoelectric transducer, said first amplifier, and said second piezoelectric transducer form a first oscillator having a first output frequency;

e) processor means coupled to said output of said first amplifier; and

f) sealing means covering said first and second piezoelectric transducers for sealing out moisture and other contaminants, wherein

displacement of said elastic member means causes a displacement of one of said first and second piezoelectric transducers relative to each other and thereby changes said first output frequency, and said first output frequency is used by said processor means to determine an indication of the weight of the load.

2. (Original) An electronic weighing apparatus according to claim 1, wherein:

said sealing means is an hermetic seal.

3. (Original) An electronic weighing apparatus according to claim 1, wherein:

said sealing means is a flexible sleeve.

4. (Original) An electronic weighing apparatus, comprising:

a) a displaceable elastic member means for receiving a load and being displaced by the load such that the displacement of said elastic member means is related to the weight of the load;

b) a first piezoelectric transducer having a first substrate and one of a first surface acoustic wave (SAW) transmitter and a first SAW receiver, said first piezoelectric transducer being coupled to said elastic member;

c) a second piezoelectric transducer having a second substrate and the other of said first SAW transmitter and said first SAW receiver, said second piezoelectric transducer being mounted in close proximity to said first piezoelectric transducer such that said displacement of said elastic member causes a corresponding displacement of one of said first and second piezoelectric transducers relative to each other;

d) a first amplifier having an input and an output, said input of said first amplifier being coupled to said first SAW receiver and said output of said first amplifier being coupled to said first SAW transmitter such that said first piezoelectric transducer, said first amplifier, and said second piezoelectric transducer form a first oscillator having a first output frequency;

e) processor means coupled to said output of said first amplifier; and

f) an hermetically sealed temperature sensor having an output coupled to said processor means, wherein

displacement of said elastic member means causes a displacement of one of said first and second piezoelectric transducers relative to each other and thereby changes said first output frequency, and said first output frequency is used by said processor means to determine an indication of the weight of the load and said processor means uses said output of said hermetically sealed temperature sensor to compensate for the effects of temperature on said output of said first amplifier.

5. (Original) An electronic weighing apparatus, comprising:

a) a displaceable elastic member means for receiving a load and being displaced by the load such that the displacement of said elastic member means is related to the weight of the load;

b) a first piezoelectric transducer having a first substrate and one of a first surface acoustic wave (SAW) transmitter and a first SAW receiver, said first piezoelectric transducer being coupled to said elastic member;

c) a second piezoelectric transducer having a second substrate and the other of said first SAW transmitter and said first SAW receiver, said second piezoelectric transducer being mounted in close proximity to said first piezoelectric transducer such that said displacement of said elastic member causes a corresponding displacement of one of said first and second piezoelectric transducers relative to each other;

d) a first amplifier having an input and an output, said input of said first amplifier being coupled to said first SAW receiver and said output of said first amplifier being coupled to said first SAW transmitter such that said first piezoelectric transducer, said first amplifier, and said second piezoelectric transducer form a first oscillator having a first output frequency; and

e) processor means coupled to said output of said first amplifier, wherein

one of said first and second piezoelectric transducers is provided with two anti-reflection structures to minimize reflection of surface acoustic waves, and

displacement of said elastic member means causes a displacement of one of said first and second piezoelectric transducers relative to each other and thereby changes said first output frequency, and said first output frequency is used by said processor means to determine an indication of the weight of the load.

6. (Original) An electronic weighing apparatus according to claim 5, wherein:

one of said two anti-reflection structures is a MYLAR film glued to said substrate.

7. (Original) An electronic weighing apparatus according to claim 5, wherein:

one of said two anti-reflection structures is a surface damper on said substrate with a multistrip coupler located between said surface damper and said SAW transmitter or receiver.

8. (Original) An electronic weighing apparatus according to claim 5, wherein:

one of said two anti-reflection structures is a layer of silicon oxide.

9. (Original) An electronic weighing apparatus, comprising:

a) a displaceable elastic member means for receiving a load and being displaced by the load such that the displacement of said elastic member means is related to the weight of the load, said elastic member having a hollowed central portion;

b) a first piezoelectric transducer having a first substrate and one of a first surface acoustic wave (SAW) transmitter and a first SAW receiver, said first piezoelectric transducer being coupled to said elastic member within said hollowed central portion;

c) a second piezoelectric transducer having a second substrate and the other of said first SAW transmitter and said first SAW receiver, said second piezoelectric transducer being mounted in close proximity to said first piezoelectric transducer such that said displacement of said elastic member causes a corresponding displacement of one of said first and second piezoelectric transducers relative to each other;

d) a first amplifier having an input and an output, said input of said first amplifier being coupled to said first SAW receiver and said output of said first amplifier being coupled to said first SAW transmitter such that said first piezoelectric transducer, said first amplifier, and said second piezoelectric transducer form a first oscillator having a first output frequency; and

e) processor means coupled to said output of said first amplifier, wherein

displacement of said elastic member means causes a displacement of one of said first and second piezoelectric

transducers relative to each other and thereby changes said first output frequency, and said first output frequency is used by said processor means to determine an indication of the weight of the load.

10. (Original) An electronic weighing apparatus according to claim 9, wherein:

one of said first and second piezoelectric transducers is provided with anti-reflection structure to minimize reflection of surface acoustic waves.

11. (Original) An electronic weighing apparatus according to claim 10, wherein:

said anti-reflection structure is one of a surface damper on said substrate, an angled cut on an end of said substrate, and a rounded end on said substrate.

12. (Original) An electronic weighing apparatus according to claim 9, further comprising:

f) a third piezoelectric transducer having one of a second surface acoustic wave (SAW) transmitter and a second SAW receiver, said third piezoelectric transducer being coupled to said elastic member within said hollowed central portion;

g) a fourth piezoelectric transducer having the other of said second SAW transmitter and said second SAW receiver, said fourth piezoelectric transducer being mounted in close proximity to said

first piezoelectric transducer such that said displacement of said elastic member causes a corresponding displacement of one of said third and fourth piezoelectric transducers relative to each other, said displacement being in a direction opposite to and in an amount substantially equal to said relative displacement of said first and second piezoelectric transducers relative to each other;

h) a second amplifier having an input and an output, said input of said second amplifier being coupled to said second SAW receiver and said output of said second amplifier being coupled to said second SAW transmitter such that said third piezoelectric transducer, said second amplifier, and said fourth piezoelectric transducer form a second oscillator having a second output frequency, said output of said second amplifier being coupled to said processor means, wherein

displacement of said elastic member means causes a displacement of one of said third and fourth piezoelectric transducers relative to each other and thereby changes said second output frequency by an opposite but substantially equal amount as said change in said first output frequency, said first and second output frequencies being used by said processor means to determine an indication of the weight of the load.

13. (Original) An electronic weighing apparatus according to claim 9, wherein:

one of said first and second substrates is mounted on a thermal sink.

14. (Original) An electronic weighing apparatus according to claim 13, wherein:

both of said first and second substrates are mounted on thermal sinks.

15. (Original) An electronic weighing apparatus according to claim 13, wherein:

said thermal sink is mounted on a thermally insulating material.

16. (Original) An electronic weighing apparatus according to claim 9, wherein:

one of said first and second transducers includes temperature sensing means on said substrate for determining the temperature of said substrate, said temperature sensing means being coupled to said processing means and said temperature being used by said processing means to determine an indication of the weight of the load.

17. (Original) An electronic weighing apparatus according to claim 16, wherein:

said temperature sensing means includes a SAW transmitter and a SAW receiver.

18. (Original) An electronic weighing apparatus according to claim 16, wherein:

said temperature sensing means is on said first substrate and comprises a SAW receiver.

19. (Original) An electronic weighing apparatus according to claim 16, wherein:

said temperature sensing means is on said second substrate and comprises a SAW transmitter.

20. (Original) An electronic weighing apparatus according to claim 17, wherein:

said temperature sensing means is located in the same acoustic channel as said first SAW transmitter.

21. (Currently amended) An electronic weighing apparatus according to claim 9, further comprising:

f) phase shift means coupled to said first amplifier for shifting the phase of said first output frequency by approximately 180~~.degree.~~ degrees; and

g) one of frequency and gain detection means coupled to said output of said first amplifier and coupled to said phase shift means for activating said phase shift means upon the detection of a predetermined one of frequency and gain.

22. (Original) An electronic weighing apparatus, comprising:

a) a displaceable elastic member means for receiving a load and being displaced by the load such that the displacement of said elastic member means is related to the weight of the load;

b) a first piezoelectric transducer having a first substrate and one of a first surface acoustic wave (SAW) transmitter and a first SAW receiver, said first piezoelectric transducer being coupled to said elastic member;

c) a second piezoelectric transducer having a second substrate and the other of said first SAW transmitter and said first SAW receiver, said second piezoelectric transducer being mounted in close proximity to said first piezoelectric transducer such that said displacement of said elastic member causes a corresponding displacement of one of said first and second piezoelectric transducers relative to each other;

d) a first amplifier having an input and an output, said input of said first amplifier being coupled to said first SAW receiver and said output of said first amplifier being coupled to said first SAW transmitter such that said first piezoelectric transducer, said first amplifier, and said second piezoelectric transducer form a first oscillator having a first output frequency; and

e) processor means coupled to said output of said first amplifier, wherein

displacement of said elastic member means causes a displacement of one of said first and second piezoelectric transducers relative to each other and thereby changes said first

output frequency, and said first output frequency is used by said processor means to determine an indication of the weight of the load, and wherein

one of said first and second piezoelectric transducers is provided with anti-reflection structure to minimize reflection of surface acoustic waves.

23. (Currently amended) An electronic weighing apparatus, comprising:

a) a displaceable elastic member means for receiving a load and being displaced by the load such that the displacement of said elastic member means is related to the weight of the load, said elastic member having a hollowed central portion;

b) a first piezoelectric transducer having a first substrate and one of a first surface acoustic wave (SAW) transmitter and a first SAW receiver, said first piezoelectric transducer being coupled to said elastic member;

c) a second piezoelectric transducer having a second substrate and the other of said first SAW transmitter and said first SAW receiver, said second piezoelectric transducer being mounted in close proximity to said first piezoelectric transducer such that said displacement of said elastic member causes a corresponding displacement of one of said first and second piezoelectric transducers relative to each other;

d) a first amplifier having an input and an output, said input of said first amplifier being coupled to said first SAW receiver and

said output of said first amplifier being coupled to said first SAW transmitter such that said first piezoelectric transducer, said first amplifier, and said second piezoelectric transducer form a first oscillator having a first output frequency;

e) processor means coupled to said output of said first amplifier, and

f) a third piezoelectric transducer having one of a second surface acoustic wave (SAW) transmitter and a second SAW receiver, said third piezoelectric transducer being coupled to said elastic member within said hollowed central portion;

g) a fourth piezoelectric transducer having the other of said second SAW transmitter and said second SAW receiver, said fourth piezoelectric transducer being mounted in close proximity to said first piezoelectric transducer such that said displacement of said elastic member causes a corresponding displacement of one of said third and fourth piezoelectric transducers relative to each other, said displacement being in a direction opposite to and in an amount substantially equal to said relative displacement of said first and second piezoelectric transducers relative to each other;

h) a second amplifier having an input and an output, said input of said second amplifier being coupled to said second SAW receiver and said output of said second amplifier being coupled to said second SAW transmitter such that said third piezoelectric transducer, said second amplifier, and said fourth piezoelectric transducer form a second oscillator having a second output

frequency, said output of said second amplifier being coupled to said processor means, wherein

displacement of said elastic member means causes a displacement of one of said first and second piezoelectric transducers relative to each other and thereby changes said first output frequency, and said first output frequency is used by said processor means to determine an indication of the weight of the load, and, wherein

displacement of said elastic member means causes a displacement of one of said third and fourth piezoelectric transducers relative to each other and thereby changes said second output frequency by an opposite but substantially equal amount as said change in said first output frequency, said first and second output frequencies being used by said processor means to determine an indication of the weight of the load.

24. (Original) An electronic weighing apparatus, comprising:

a) a displaceable elastic member means for receiving a load and being displaced by the load such that the displacement of said elastic member means is related to the weight of the load;

b) a first piezoelectric transducer having a first substrate and one of a first surface acoustic wave (SAW) transmitter and a first SAW receiver, said first piezoelectric transducer being coupled to said elastic member;

c) a second piezoelectric transducer having a second substrate and the other of said first SAW transmitter and said first SAW

receiver, said second piezoelectric transducer being mounted in close proximity to said first piezoelectric transducer such that said displacement of said elastic member causes a corresponding displacement of one of said first and second piezoelectric transducers relative to each other;

d) a first amplifier having an input and an output, said input of said first amplifier being coupled to said first SAW receiver and said output of said first amplifier being coupled to said first SAW transmitter such that said first piezoelectric transducer, said first amplifier, and said second piezoelectric transducer form a first oscillator having a first output frequency; and

e) processor means coupled to said output of said first amplifier, wherein

displacement of said elastic member means causes a displacement of one of said first and second piezoelectric transducers relative to each other and thereby changes said first output frequency, and said first output frequency is used by said processor means to determine an indication of the weight of the load, and wherein

one of said first and second transducers includes temperature sensing means on said substrate for determining the temperature of said substrate, said temperature sensing means being coupled to said processing means and said temperature being used by said processing means to determine an indication of the weight of the load.

25. (Original) An electronic weighing apparatus according to claim 24, wherein:

said temperature sensing means includes a SAW transmitter and a SAW receiver.

26. (Original) An electronic weighing apparatus according to claim 24, wherein:

said temperature sensing means is on said first substrate and comprises a SAW receiver.

27. (Original) An electronic weighing apparatus according to claim 24, wherein:

said temperature sensing means is on said second substrate and comprises a SAW transmitter.

28. (Original) An electronic weighing apparatus according to claim 25, wherein:

said temperature sensing means is located in the same acoustic channel as said first SAW transmitter.

29. (Currently amended) An electronic weighing apparatus, comprising:

a) a displaceable elastic member means for receiving a load and being displaced by the load such that the displacement of said elastic member means is related to the weight of the load;

b) a first piezoelectric transducer having a first substrate and one of a first surface acoustic wave (SAW) transmitter and a first SAW receiver, said first piezoelectric transducer being coupled to said elastic member;

c) a second piezoelectric transducer having a second substrate and the other of said first SAW transmitter and said first SAW receiver, said second piezoelectric transducer being mounted in close proximity to said first piezoelectric transducer such that said displacement of said elastic member causes a corresponding displacement of one of said first and second piezoelectric transducers relative to each other;

d) a first amplifier having an input and an output, said input of said first amplifier being coupled to said first SAW receiver and said output of said first amplifier being coupled to said first SAW transmitter such that said first piezoelectric transducer, said first amplifier, and said second piezoelectric transducer form a first oscillator having a first output frequency;

e) processor means coupled to said output of said first amplifier;

f) phase shift means coupled to said first amplifier for shifting the phase of said first output frequency by approximately 180~~.degree.~~ degrees; and

g) one of frequency and gain detection means coupled to said output of said first amplifier and coupled to said phase shift means for activating said phase shift means upon the detection of a predetermined one of frequency and gain, wherein

displacement of said elastic member means causes a displacement of one of said first and second piezoelectric transducers relative to each other and thereby changes said first output frequency, and said first output frequency is used by said processor means to determine an indication of the weight of the load.